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Double elastic elliptical coupling  
[Doppelt elastische Ellipsenkupplung]

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### Double Elastic Coupling

The invention concerns a coupling consisting of two halves - an inner and an outer halve - that interlock via elastic ellipses.

In known couplings of this kind, one half is equipped with guide blocks while the other half is equipped with pockets where the guide blocks interlock.

Elastic rubber or leather pieces separate the individual pockets from each other. These elastic tailor-made pieces also serve for the transfer of the torque, whereby the narrow surfaces of the guiding blocks press against these pieces as buffers. These buffers are used as buffers for bending and for wear. This has proven to be disadvantageous for the continued operation of the couplings, because practice has shown that the rubber or leather pieces are subjected to significant wear at the side surfaces over time.

The resulting reduction of the cross section will be increased by the bending stress of these buffers, as the wear takes place at the weakest points of the rubber or leather pieces (see attached copy). As a consequence, the coupling quickly becomes useless and will slip.

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<sup>1</sup> Numbers in the margin indicate pagination in the foreign text.

The goal of the invention is to design a coupling of the described type on which the elastic bodies are used at their strongest points through torque-to-bore volume ratio.

The invention is also based on the goal to design the coupling in such a way that the elastic bodies are designed as a large surface in the direction of force in order to minimize wear.

The ellipsis form in its longitudinal axis is the closest solution for force assimilation. The new material Vulkollan is planned as material for the elastic bodies, which fulfills the best the requirements of being highly flexible, highly durable, oscillation damping, wear proof, and abrasion safe for a high value coupling material.

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The invention also assumes that the present high elasticity of the material is further increased by an air gap (double elasticity).

An additional advantage of the construction according to the invention is that the coupling is not equipped with guiding blocks or radial arms made of cast iron or anything similar, as rigid parts require a certain space for themselves which would be lost for the accommodation of elastic bodies.

In the described invention, the largest possible space is reserved for the elastic bodies within the partial circle, while the rigid separation circle has only a low volume.

The opposite is true for known couplings. The rigid guiding blocks are three to five times wider than the narrow buffers.

Practice has shown that the largest spring volume is best for minimizing the torque impact. This also means that the design of the coupling diameter can be smaller, the weight can be lighter and the oscillation can be smaller for operating with a certain torque, leading to an essential protection of the appropriate drive aggregate.

A significant advantage of the construction according to the invention is that the same uniformly dimensioned elliptically formed body can be used for all coupling sizes. The number of spring elements changes with the size of the coupling diameter.

In known couplings, the elastic body changes with a wider coupling size in its length, width and height, meaning that for a coupling size of 75 mm to 5,500 mm diameter, 18 rubber or leather sizes of unequal dimensions would have to be determined. If one uses an average of eight pieces of buffer per coupling, then  $18 \times 8 = 144$  replacement pieces must be stored so that they can be made available if one or the other coupling size fails. In the described construction only 20 pieces would be necessary in a worst case scenario.

The coupling according to the invention is also very practical for balancing alignment errors per shaft displacements, as the elastic bodies are somewhat convex. In addition, the construction has the advantage of facilitating the very fast exchange of the pressure bodies, if that should ever

become necessary. After lifting the snap ring, the steel disc can be removed from the hub and the Vulkollan is free.

(Illegible)

The descriptions are shown in greater detail in the drawings.

Fig. 1 shows a view of the couplings halves with the ellipsis.

Fig. 2 shows a cross section of a complete coupling.

Between the outer coupling ring 1 and inner ring 2 are the ellipsis bodies equally distributed on the circumference and an air gap 4 each.

Each half has a hub 5, a bore 6 and a groove 7. The steel disc 8 closes the bodies off on one side and is held by a snap ring 9.

Claims:

- 1) Coupling consisting of two halves movable against each other that interlock via elastic members, characterized in that both body halves have ellipsis cutouts.
- 2) Coupling according to Claim 1 characterized by ellipse pressure bodies, half located at the outer ring and half at the inner ring.
- 3) Coupling according to Claim 2 characterized in that the major axle of the ellipsis touches the parting point of the part circle as contact tangent.

4) Coupling according to Claim 3 characterized in that the part circle is also the parting circle for the inner and outer ring.

5) Characterized according to Claims 2 and 3 by an ellipse body that has an air gap within the smaller axis to increase additional elasticity (double elastic).

6) Claims according to Claims 2, 3, and 5 characterized in that the ellipsis body is somewhat convex at the upper and lower curve part.

Fig. 1

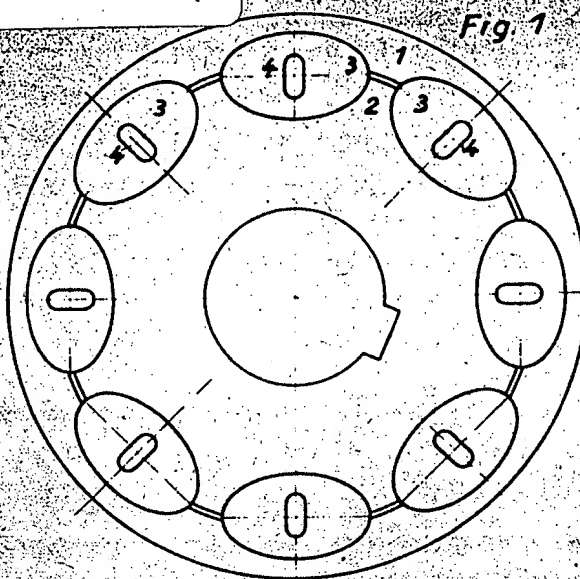


Fig. 2

